

## ADJUSTABLE SHOE AND METHOD OF MANUFACTURING SAME

DESCRIPTIONTechnical Field

5 This invention concerns footwear manufacture and, more specifically, the manufacture of shoes that are adaptable to the shape of the foot.

Background Art

It is known that all models of footwear are produced on the basis of a form, which to a large extent determines the comfort of the fit.

10 Since the shape of the foot varies considerably among different people and even in the same person at different times or for specific reasons (overheating, problems of circulation, local pathologies), the same model of shoe is unlikely to be perfectly comfortable for most of the wearers, who may experience a feeling of discomfort and sometimes even pain.

15 To overcome this problem, elasticized uppers are used, but this has obvious limitations in the forms on which they can be used and thus in the types of models that can be produced.

20 There is also some use of footwear models equipped with one or more elastic bands joining slits made in the upper. These bands, that generally replace closing laces and zippers, have the specific function of facilitating the insertion of the foot into the shoe. During assembly of the shoe, these bands have to be blocked with tapes that are then removed. This limits the use of elastic bands to those parts of the shoe that are readily accessible for the removal of the blocking tapes.

25 Lastly, many solutions have been suggested for producing a shoe that is adaptable to the different shapes of the feet of the wearers (see in particular EP 458881, the corresponding US 5060402 patent and the other patents mentioned in them). These solutions are, however, extremely complex and therefore not readily and economically applicable on an industrial scale.

Disclosure of Invention

30 The object of this invention is, therefore, to provide a type of footwear that adapts to the different shapes of the feet of the wearers, overcoming the limitations of the known

solutions.

In particular, the object of this invention is to provide an adaptable shoe which can be produced in a wide range of models, and which is easy and economical to manufacture.

These and other objects are achieved with a shoe in which parts of the upper, bonded by stitching or folding, are joined by elastic means.

More specifically, in a shoe made according to the invention, at least one border or joint is provided on the visible part of the upper and at least one strip of elasticized fabric or elastic tape is provided, on the inside of the shoe, joining opposite parts of the upper with respect to the border or joint.

Advantageously, borders or joints aligned substantially in the direction of the longitudinal axis of the shoe permit, by effect of the stretching of the elasticized fabric or elastic tapes, a variation of the transversal dimension of the shoe thereby achieving ideal adaptation to the shape of the foot.

Among the objects of the invention is also that of providing a method for the manufacture of a shoe which adapts to the different shapes of the feet of the wearers.

This objects is achieved with a method of manufacture consisting of arranging one or more borders or joints in the upper, temporarily stabilizing said borders or joints, applying an elasticized fabric or tape underneath said borders or joints so as to connect parts of the upper opposite them, completing the upper, assembling the shoe and removing the temporary stabilization of the borders or joints.

This temporary stabilization of the borders or joints, which can be achieved, in practice, by stitching, serves to facilitate assembly of the shoe, which would not be possible otherwise because the presence of the elasticized fabric or tape would cause distortion of the upper at the point where the borders or joints are located.

Many advantages are offered by a shoe made according to the invention. In the first place the shoe, being permanently adaptable to the shape of the foot, ensures a high degree of comfort no matter what the morphologic condition of the foot. In the second place the shoe can be made of any suitable material, such as leather, imitation leather, fabric and plastic, and in an almost unlimited number of models, the esthetics of which are practically unaffected by the alterations undergone by the upper to adapt to the foot.

Furthermore, the manufacture of the shoe is simple and does not involve substantial increases over the usual costs.

These and other advantages, along with the technical features of this invention, will be made clear by the detailed description that follows of a few examples, without limitation, of its implementation.

### Brief Description of Drawings

In the drawings:

- Fig. 1 illustrates a schematic side view of a first model of shoe according to the invention, in which the upper is provided with a border, in the final stage of manufacture;
- Fig. 2 illustrates a cross-section according to II-II of the shoe shown in Fig. 1 after completing manufacture and in the configuration it has when not worn (that is, with the foot outside the shoe);
- Fig. 3 illustrates an enlargement of the border, circled in Fig. 2, provided in the shoe upper;
- Fig. 4 illustrates the border shown in Fig. 3 temporarily fastened by stitching;
- Fig. 5 illustrates the border shown in Fig. 3 in the configuration it has when a foot is inside the shoe causing an enlargement of it;
- Fig. 6 illustrates a schematic side view in perspective of a second model of shoe according to the invention, in which the upper is provided with a joint, in the final stage of manufacture;
- Fig. 7 illustrates an enlarged cross-section of the portion of the joint, marked VII in Fig. 6 and the shape it acquires when the finished shoe is not worn;
- Fig. 8 illustrates enlarged cross-section of the portion of the joint, marked VIII in Fig. 6;
- Fig. 9 illustrates the joint in Fig. 7 and the shape it acquires when the finished shoe is worn by a foot that causes an enlargement of it;
- Fig. 10 illustrates enlarged cross-section of another joint fastened temporarily by a stitching, in a preferred embodiment of the invention;
- Figures 11 to 14 illustrate an plan view from above and from below of an upper in



provided in the upper, lying parallel or not to the longitudinal axis of the shoe. For example, in the moccasin 30 illustrated in Fig. 6, a second joint 37 is shown in the side of the shoe. Also, under the borders or joints, several elasticized tapes can be provided. Fig. 10 illustrates another joint 60 obtained by sewing with a thread 62 the lower facing ends of two parts 60a,60b of the upper. Another row 64 of removable stitching is also shown for the purposes indicated below. Also, in the embodiment of the invention shown in the figure, underneath the joint 60 there is a lining 66 in elasticized fabric fastened to the upper, by two rows 40',42' of stitching, on the sides opposite the joint 60. Fig. 15 illustrates the cross section of the shoe shown in Fig. 1 produced according to the preferred embodiment of the invention described above.

For the manufacture of a shoe that is adaptable to the foot, in conformity with this invention, it is essential to stabilize the borders or joints temporarily so that the shoe can be assembled.

In particular, a first method of manufacture consists of:

- a) forming one or more borders or joints in an upper and securing them with temporary means, preferably an easily removable type of stitching made with a Strobel or similar machine: by way of example, Fig. 11 and Fig. 12 illustrate a plan view, from above and below, of an upper 50 folded to form a border 52, which has been temporarily secured by a row 54 of stitching;
- b) applying one or more elasticized tapes on the underside of the upper so as to connect parts of the upper opposite each other with respect to the borders or joints temporarily stitched: Fig. 13 and Fig. 14 show a plan view, from above and below, of the upper 50 with an elasticized tape 56 applied to the underside with two rows 58,59 of stitching along the border 52;
- c) completing the upper, by applying a lining which is elasticized at least in the zone occupied by the tapes;
- d) assembling the shoe in the usual way to obtain the model desired, with the borders or joints secured temporarily, as shown in Figures 4, 8 and 10;
- e) removing the temporary stitching; Fig. 1 and 6 show the removal of the rows 24,44 of stitching used to secure the border 16 and the joint 36 temporarily.

Fig. 16 illustrates a plan view from below of an upper 50' in a first effective variation of the method described above. In this case two elasticized tapes 56',56" are provided, sewn to a lining 68 of any kind (even in non-elasticized fabric) and applied to the upper 50' by stitching 58',59',58",59", along two borders or joints.

- 5 In a second preferred variation, illustrated in Fig. 17 (as well as in Fig. 10 and in Fig. 15), the opposite sides of the borders or joints formed in an upper 70 are connected directly by a lining 72 in an elasticized fabric fastened to the upper by two rows 74,76 of stitching.

The invention thus conceived may be subject to numerous modifications and variations,  
10 all falling within the scope of the inventive concept. Furthermore, all the details can be replaced with technically equivalent elements.